ASOS MODIFICATION NOTE 60 (for Electronics Technicians)
Engineering Division
W/OSO321:WW

SUBJECT	:	Acquisition Control Unit (ACU) Memory Erasable Programable Read Only Memory (EPROM) Firmware Version 2.50 Data Collection Package (DCP) Boot EPROMs Firmware Version 1.80
PURPOSE	:	Time Critical Firmware Upgrade for the Automated Surface Observing System (ASOS) Operational Load. **Installation must be completed on or before November 4, 1998.**
EQUIPMENT AFFECTED	:	ASOS Acquisition Control Unit (AACU) ASOS Data Collection Package (ADCP)
PARTS REQUIRED	:	ACU Memory Microcircuit P/N 62828-45002-1 ACU Memory Microcircuit P/N 62828-45003-1 ACU Memory Microcircuit P/N 62828-45004-1 ACU Memory Microcircuit P/N 62828-45005-1 DCP Microcircuit P/N 62828-45018-1 DCP Microcircuit P/N 62828-45019-1
MOD PROCUREMENT	:	The above parts are available through the National Logistics Supply Center and are required for all ASOS sites. ASOS Electronics Technicians (ET) will need to order the ACU EPROMs Agency Stock Number (ASN) S100-1A2A3-U8E for each ASOS site and for sites not having installed Modification Note #38 (ACU Firmware V2.49 Upgrade Installation). ETs will need to order ASN S100-2A1A2A1U29 for each DCP Central Processing Unit (CPU).
SPECIAL TOOLS REQUIRED	:	Integrated Circuit (IC) insertion tool (ASN: 041-T-13) IC extraction tool (ASN: 041-T-16) Conductive foam Electrostatic discharge (ESD) straps
TIME REQUIRED	:	2 hours
EFFECT ON OTHER INSTRUCTIONS	:	Engineering Handbook No.11 (EHB-11), Automatic Observing Equipment , section 3.6, references Modification Note 38
AUTHORIZATION	:	This modification is authorized by Engineering Change Proposal **ECP-NWS469S.**

VERIFICATION STATEMENT : This modification has been tested for operational integrity at the sites listed in appendix A.

GENERAL

This modification note provides procedures to upgrade the ASOS software by removing and replacing EPROMs on the ACU memory board (and each DCP CPU, if applicable). This firmware provides the Field Meteorological Handbook change, in the Meteorological Aviation Report, from 'PE' to 'PL' and allows the present weather field to be edited with 'PL.'

If the current ACU firmware version is 2.4 or less, the DCP CPU firmware *must* be upgraded to firmware version 1.80.

Please note that MCO (Orlando, FL) has been added to the sites requiring the upgrade to V2.5. This site was not on the original list and must also be upgraded to V2.50 by November 4, 1998.

PROCEDURE

The following installation instructions are for EPROMs U7, U8, U17, and U21 on the ACU memory board 1A2A3. Instructions are included for EPROMs U29 and U30 on the DCP CPU 2A1A2A1 and 2A1A2A2 (if installed).

CAUTION:

Be careful to protect the electronics on the ACU memory and DCP CPU boards during this procedure. Do not reconfigure any jumpers on the ACU memory or DCP CPU boards unless instructed.

BEFORE INSTALLING FIRMWARE

1. Call the AOMC at 1-800-242-8194 and provide notification on which ASOS you will be installing the new ACU and DCP firmware. Confirm that the AOMC will provide access to the site-specific data base. Coordinate with the AOMC that the data base is available. Upload the current configuration before installing the new firmware.

2. Get approval of the responsible MIC/OIC before starting installation. You may install on any day of the month if restrictions in steps 3 and 4 are satisfied.

3. **Commissioned Sites Only**: Do not start installation during bad weather, precipitation, instrument flight rule conditions, or if any of these conditions are expected within 3 hours. The responsible MIC/OIC will define these meteorological conditions.

4. Do not start firmware installation at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although 1 hour should be sufficient, allow 2 hours to complete the installation and restart ASOS.

5. Immediately before beginning work at National Weather Service (NWS) staffed sites, the MIC/OIC will inform the air-traffic control tower (ATCT) and any other critical users that ASOS will be shut off for a firmware upgrade. At an unstaffed site, the ETs will inform the ATCT using controller-video displays (CVD) and operator interface devices (OID) to log off and shut down the display power to avoid confusion.

   NOTE:
   Commissioned sites only are to download the following data to the laptop using the direct command mode: 5-minute data (12 hrs.), SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files. Forward collected data to the responsible Data Acquisition Program Manager.

6. Do not begin the installation process (i.e., halt ASOS) until immediately after an hourly observation has been transmitted. At NWS staffed sites, normal back-up observing procedures will be implemented.

7. Go to the AOMC page (REVUE-SITE-VERSN-AOMC). Wait for the external communication and the site physical lines to change from "UPLOAD REQ" to "COMPLETE" before going to the next step. Disable all hardware and dial the communication ports to AFOS (REVUE-SITE-CONFG-COMMS). The system voice function will automatically broadcast a "not available" message when the ACU power is turned off.

8. Make the appropriate SYSLOG entries: (MAINT-ACT-FMK) for Modification Note 60.
   a. Log on as **TECH**.
   b. Key the **MAINT** screen.
   c. Key the **ACT** page.
   d. Key **START** - Stop here and perform “ASOS Software Version 2.50 Upgrade.”

ASOS SOFTWARE VERSION 2.50 UPGRADE

GENERAL

All ASOS application software is contained on the four EPROM IC on ACU memory board 1A2A3. Figure 1 illustrates the ACU memory board and identifies the four EPROMs (U7, U8, U17, and U21) to be replaced. Figure 2 illustrates DCP memory board 2A1A2A1 and/or 2A1A2A2 and identifies EPROMs (U29 and U30) to be replaced. The EPROMs are 32-pin dual in-line package CMOS devices, each providing 512K x 8 bits of storage. Upgrading ASOS software requires only replacing the four EPROMs on the ACU memory board with a higher revision level of ICs.

The four EPROMs on the ACU memory board contains both the ACU application program and the DCP application program. The CPU runs the application program directly from the ACU memory board. The DCP application program must first be downloaded from the ACU memory board to the random access memory (RAM) storage in the DCP before it can be run by the DCP CPU.

Sites without a local OID (i.e., # RS232 connected for the primary OID) should attach a laptop computer to the primary OID port of the ACU 1A9J22 following the procedure in table 2.3.9

(Connecting Laptop Computer as Primary OID), on pages 2-31, of the S100 ASOS Site Technical Manual.

SOFTWARE UPGRADE PROCEDURE

This procedure provides instructions to upgrade ASOS software by removing and replacing the EPROMs. ***This procedure starts with the DCP and then advances to the ACU***. After the new EPROMs are installed in the DCP(s), perform a hard reset of each DCP from the processor status page on the OID. And it is no longer necessary to cold start the ACU by removing battery jumper J22 (figure 1) to clear all RAM on the board. Then receive a download of site-specific data from the AOMC.

After completion of the upgrade procedure, the EPROMs removed from the ACU and DCP boards should be packaged in the appropriate ESD protective material to be returned to the National Reconditioning Center (NRC).

NOTE:
There may be approximately a 20-minute wait required to access the AOMC.

DCP Firmware Version 1.80 EPROM Installation (if firmware version is less than 1.80):

1. ***If more than one DCP is at the site, each DCP must receive this modification.***

   CAUTION:
   Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (OFF) and facility power is removed.

   To avoid damage to circuit boards and ICs, use proper ESD handling procedures, including using a grounding strap when performing the following steps.

2. Set the OUTPUT POWER switch on the uninterruptible power supply (UPS) status panel to the 0 (**OFF**) position. The indicator for the OUTPUT status panel extinguishes. (This step is only required on systems with a UPS.)

3. Remove the facility AC power from the DCP cabinet by turning off the circuit breakers in the AC junction box or turning off the facility disconnect box.

4. Remove the radio cable(s) from the JK1 connector on the front of the CPU board located in 2A1A2A1 (and 2A1A2A2 if installed).

5. Using a small flat blade screwdriver, loosen the captive screws located at the top and bottom of the DCP CPU board(s) 2A1A2A1 (and 2A1A2A2 if installed).

6. Press the extractor handles at the top and bottom of the DCP CPU boards 2A1A2A1 (2A1A2A2 if required) in the opposite directions to the release board. Remove the board from the rack.

NOTE:

A supply of IC extraction and insertion tools are in stock for the ETs to purchase. They are located in the miscellaneous tools and supplies section of Engineering Handbook No. 1 (EHB-1), Instrumental Equipment Catalog.

7. Using an IC extractor, remove U29 and U30 from the DCP CPU printed circuit board(s) 2A1A2A1 (and 2A1A2A2 if installed). Place the removed integrated circuits in a conductive foam or on some other static-free surface.

8. Remove the new EPROM ICs from the protective package, and insert them into the DCP CPU board sockets in accordance with the following chart. Ensure that the EPROMs are installed with pin 1 (as identified by the notch in the top of IC) oriented toward board connectors P1 and P2 as shown on figure 2.

IC socket	IC part number
U29	62828-45018-1 Version 1.80
U30	62828-45019-1 Version 1.80

9. Hold the DCP CPU board by the handles, positioning the board with the component side facing to the right and carefully slide the board into the card rack on its guides. Align the board with the rear connector and press into place.

10. Using a small flat blade screwdriver, tighten the captive screws located at the top and bottom of the DCP CPU board.

11. Reconnect the radio cables removed in step 4 to the CPU cards at JK1. Observe the marking on the cables to ensure proper connection.

12. Apply the facility AC power to the DCP cabinet.

13. Set the OUTPUT POWER switch on the UPS status panel to the 1 (**ON**) position. This is the indicator for the OUTPUT status panel lights. (This step is only required on systems with a UPS.)

14. If there is more than 1 DCP at the site, perform steps 2-13 of the “DCP Firmware Version 1.80 EPROM Installation (if firmware version is <1.80)” for each DCP before proceeding to step 15.

15. Proceed with the “ACU Firmware Version 2.50 EPROM Installation.”

ACU Firmware Version 2.50 EPROM Installation:

1. If the printer is on-line, place it off-line by pressing the **ON-LINE** switch located on the printer front panel.

CAUTION:

Damage to equipment may result if power is not removed prior to removal or installation. Ensure that OUTPUT POWER switch is set to 0 (OFF) and facility power is removed.

To avoid damage to circuit boards and ICs, use proper ESD handling procedures including using a grounding strap when performing the following steps.

2. Set the OUTPUT POWER switch on UPS status panel to the 0 (**OFF**) position. The indicator for the OUTPUT status panel extinguishes. (This step is only required on systems with a UPS.)

3. Remove the facility AC power from the ACU.

4. Using a small flat blade screwdriver, loosen the captive screws located at the top and bottom of the blank panel located in the ACU at 1A2A4. This panel must be removed before removing the memory board in slot 1A2A3 to avoid damage to the IC on the memory card.

5. Using a small flat-tipped screwdriver, loosen the captive screws located at the top and bottom of the ACU memory board 1A2A3.

6. Press the extractor handles at the top and bottom of memory board 1A2A3 in the opposite direction to release the board. Remove the board from the rack.

7. On the underside of the memory board, using a flat blade screwdriver, remove the three screws and flat washers securing the front panel to the board. Remove the board from the front panel.

CAUTION:

Lift the IC as evenly as possible. Failure to comply may result in damage to the ICs.

8. Use an IC extraction tool to remove U7 from the front of the board slide. Carefully lift up on U7 to remove it from the socket as evenly as possible. After U7 is removed, place it in a conductive foam or on some other static-free surface. See note on page 4 for instructions on obtaining IC extraction/insertion tools.

9. Repeat step 8 for removing the following integrated circuits: U8, U17 and U21.

CAUTION:

The ACU memory board has a battery that keeps voltage on the RAM sockets. DO NOT use a metal insertion tool when installing the RAM ICs. Avoid shorting out the voltage and ground pins. Shorting out the voltage pin will corrupt any stored data and is similar to performing a cold boot.

10. Remove the new EPROM ICs from the protective package and insert them into the memory board sockets in accordance with the following chart. Ensure that the EPROMs are installed with pin 1 (as identified by the notch in top of IC) oriented toward board connectors P1 and P2 as shown on figure 1.

IC socket	IC part number
U7	62828-45004-1
U8	62828-45002-1
U17	62828-45003-1
U21	62828-45005-1

11. Using a small flat-blade screwdriver, install the three flat washers and screws. This will secure the front panel to the board.

12. Holding the ACU memory board by the handles, position the board with the component side facing to the right and carefully slide the board into VME slot 1A2A3. Align the board with the rear connector and press it into place. Reinstall the ACU 1A2A4 board blank panel.

13. Use a small flat-blade screwdriver to tighten the captive screws located at the top and bottom of the boards and blank panels.

14. Sites identified in appendix B requiring Next Generation Runway Visual Range (NGRVR) must complete this step. Verify that J42 has been installed on the ACU I/O panel. If not , remove the J42 connector cover and save the hardware. Install connector S100-1A9J22 using the removed hardware. ACUs with serial numbers less than 289 must install a RS-422 cable adapter S100-1A9W1 on the inside of the J42 connector. This cable corrects a wiring error in the serial input/output (SIO) cable harness. Connect P18 of the cable harness to J42 or the cable adapter as appropriate.

15. Apply the facility power to the ACU cabinet. Set the OUTPUT POWER switch to the 1 **(ON**) position. (This step is not required for systems that do not have a UPS).

16. After the power is applied to the ACU, one of the PASS (Green) LEDs on the CPU should illuminate and the PASS LED on the other CPU will remain off. After approximately
1 minute, the LED that was off should start blinking.

17. Place the printer on-line by pressing the **ON-LINE** switch located on the printers front panel. The **ON-LINE** indicator illuminates.

18. With the power applied to the ACU and OID and after a brief warmup delay, the OID displays 1-minute data. If the display is not being updated, press the HELP key twice to refresh the screen. The NEED SID AND AOMC PHONE message appears at the top of the screen. If this does not occur, return to REMOVAL procedure, step 1. Follow the steps until the ACU memory board is removed. Ensure that the ACU EPROMs are installed correctly. Follow the INSTALLATION procedures to replace the ACU memory board.

19. At the OID, sign onto the system as a Technician. Passwords are reset to the default values.

20. Display the external communications' page on the OID (sequentially press REVUE-SITE-CONFG-EXTRN keys from the 1-minute display). Enter both AOMC phone numbers (1-800-253-4717 & 1-800-434-1133) into the AOMC PHONE NUMBER field, and press the EXIT function key.

21. Display the site physical page on the OID (sequentially press REVUE-SITE-PHYS function keys from 1-minute display). Enter the three or four character SID code in the STATION IDENTIFIER field, and press the EXIT key. The system then calls the AOMC and receives a download of site-specific data.

22. Display the AOMC version page on the OID (sequentially press REVUE-SITE-VERSN-AOMC function keys from the 1-minute display). This will allow you to observe that the files are being downloaded from the AOMC. All status fields should read "COMPLETE" in approximately 5 minutes. Then press EXIT.

NOTE:
The following steps cold start the DCPs.

23. Display the maintenance page on the OID (press the MAINT function key from the 1-minute display).

24. Using the PREV/NEXT keys, position the cursor over the PROC field and press the SEL key. The OID displays the processor status page.

25. Using the PREV/NEXT keys, position the cursor over the DCP #1 - HARD field and press the RESET key. Respond "YES" and "ENTER" to the "ARE YOU SURE?" message. The corresponding status field displays INITIALIZING while the unit is initializing. The progress of the download can be monitored by the PERCENT COMPLETE message that appears at the top of the screen. When it reaches 100, the DCP status field changes to RUNNING in a single DCP configuration.

26. If the system contains more than one DCP, repeat step 25 for DCPs #2 and #3 as required. Once all the DCPs have been completed, the DCP status field will change to RUNNING. If the DCP status does not change to RUNNING or sensor data is not being returned from the DCP, it will be necessary to pull the battery jumper on each DCP memory board.

27. If NGRVR was installed in conjunction with this modification, it will be necessary to configure the NGRVR on SIO board 1 (RS-422) port 3. (Refer to the NGRVR sites identified in appendix B.) From the 1 minute page, key REVIEW-SITE-CONFIG-COMMS and configure SIO board 1 port 3 as RVR. Set the following parameters: ENABLE, 2400, EVEN, 7, 1, NONE, HARDWIRE.

28. Clear any maintenance flags that occur as a result of the restart.

29. Display the software version page on the OID (sequentially press REVUE-SITE-VERSN-SW function keys from the 1-minute display). The following fields should display version 2.50: MEMORY ACU APPLICATION EPROM, MEMORY DCP APPLICATION EPROM, and MEMORY DCP APPLICATION RAM. The PSOS field should display 1.80 for the DCP. It may take 5-10 minutes before each field display is updated.

30. Reenable all hardware and dial the communication ports to AFOS (REVUE-SITE-CONFG-COMMS).

31. Upload the site configuration to the AOMC. Go into the AOMC page (REVUE-SITE-VERSN-AOMC) and wait for all the lines to change from “UPLOAD REQ” to “COMPLETE.”

32. Two or three hours after installation, dial into the system and verify that the date and time are correct.

33. Upon completion of the firmware installations, continue with “After Installation of Firmware Version 2.50.”

ASSEMBLY DRAWING

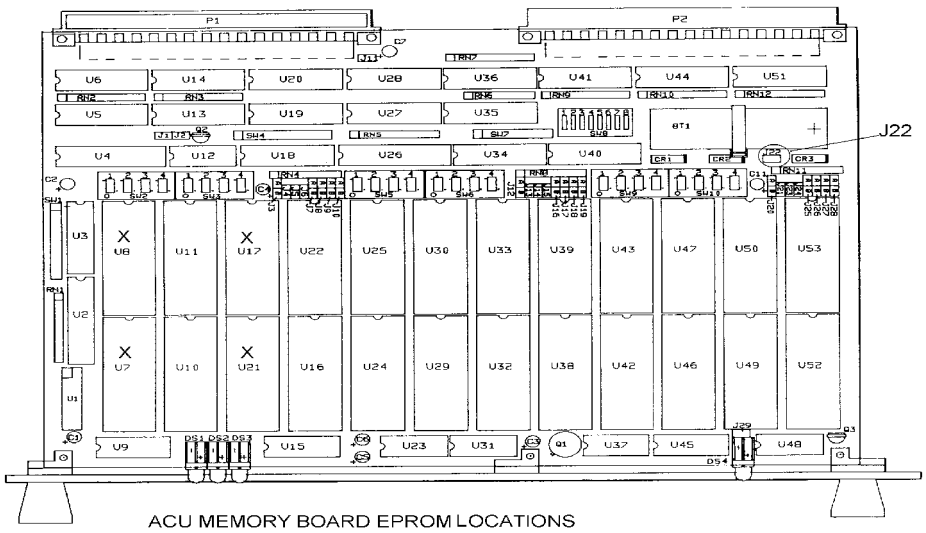

FIGURE 1

EPROM
U7
U8
U17
U21

ASSEMBLY DRAWING

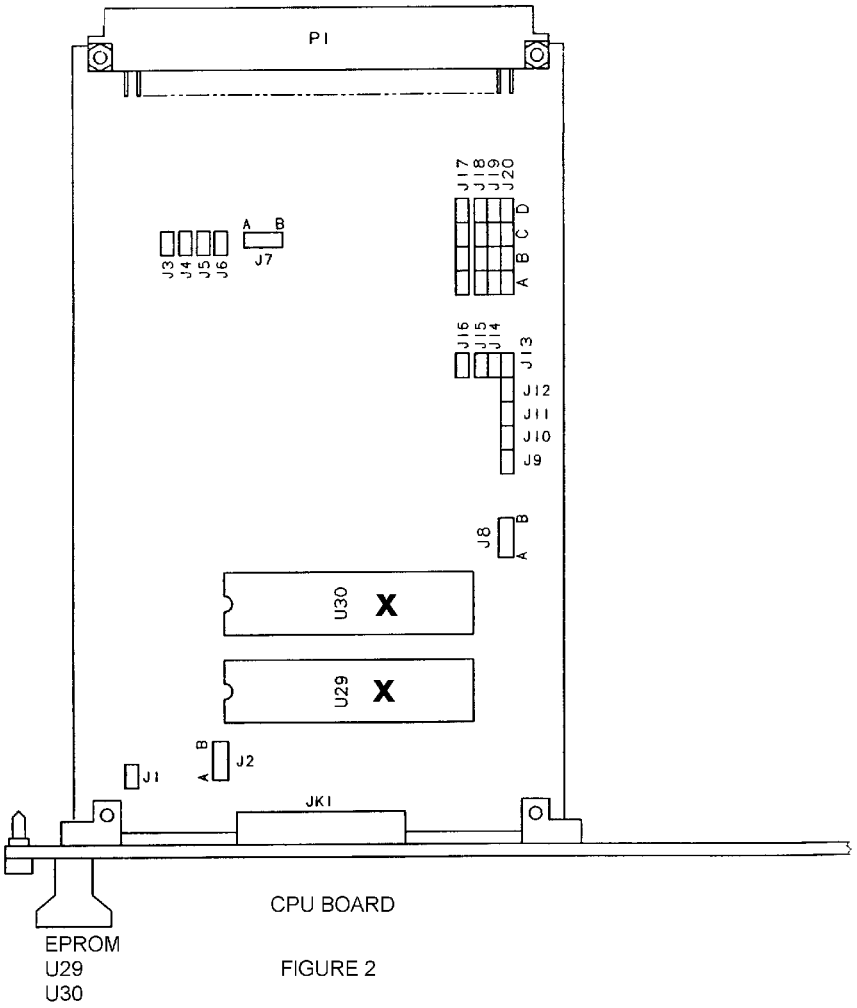

FIGURE 2

AFTER INSTALLATION OF FIRMWARE VERSION 2.50

1. When ASOS is restarted at unstaffed sites, call to inform the towers using CVDs and OIDs to turn on their displays. (At staffed sites, the MIC/OIC will call the tower.)

2. If on-site, NWS staff provides backup while the installation is underway. No special observation is needed when the ASOS is restarted. (Proceed to step 3.)

   If there is no backup at a site and a record observation was missed during the installation, a special observation must be taken when ASOS is restarted. The ET should take the following steps at the ASOS keyboard:
   a. Press **SIGN**.
   b. Type his/her initials and press **RETURN**.
   c. Type the observer level password and press **RETURN**.
   d. Press **GENOB**.
   e. Press **SPECL**.
   f. Press **EXIT**.
   g. Press **SIGN**.
   h. Type his/her initials again and press [RETURN].
   I. Press [RETURN] twice. This signs the "observer" off ASOS.
   j. Leave ASOS running.

   NOTE:
   The observer must sign off before the 5-minute edit time is up.

3. Inform the office staff that the ASOS is again operational. If less than 25 minutes remain until the next hourly observation, augmentation of the ceiling may be required. Augmenting several elements (or even the entire observation) may be necessary. The chart below indicates how long it takes after a reboot for ASOS to report each observation element automatically.

Times Needed for Elements to be Reported Automatically

Sensor	Minimum Time	Maximum Time
Pressure	60 seconds	10 minutes
Precipitation Amount	60 seconds	*
Wind direction	2 minutes	7 minutes
Wind speed	2 minutes	7 minutes
Precipitation Type	2 minutes	*
Temperature	5 minutes	10 minutes
Dew Point	5 minutes	10 minutes
Visibility	10 minutes	15 minutes
Obstruction to Visibility	10 minutes	*
Ceiling	30 minutes	35 minutes

(*) Maximum time not applicable since phenomena may not be present. Minimum time applies if phenomena are present.

4. Verify that the ASOS transmitted an hourly observation. Call the AOMC at 1-800-242-8194 and tell the operator:
   a. Your location;
   b. That installation of the new firmware has been completed; and
   c. That the ASOS is operational.

5. Enter in the SYSLOG that maintenance has been completed.
   a. Key the **MAINT** screen.
   b. Key the **ACT** page.
   c. Key **FMK** - Enter the Field Mod Kit (FMK) number as follows: **Modification Note 60**. On the second line of the screen, verify that only Mod 60 is displayed. Complete by entering **Y** in the Y/N area if only Mod 60 is displayed. If other modifications are completed, make the appropriate log entry.
   d. Check the SYSLOG, and verify the FMK message. Enter a comment in the SYSLOG stating that version 2.50 for the ACU and version 1.80 for the DCP has been installed.
   e. Notify the AOMC via telephone that Mod 60, Firmware v2.50/v1.80 has been completed.

6. At an expansion site with ATCT, the ET will contact the ATCT and supply information on the following:
   a. ASOS maintenance has been completed.
   b. ASOS has been restored to service.
   c. Tower CVDs, OIDs, and TRACON displays need to be turned on.

7. Parts removed (EPROMs) should be properly packed and returned to NRC.

Reporting Modification

This modification must be completed and reported no later than November 4, 1998. Report the completed modification on a NWS Form A-26 Maintenance Record. Follow the instructions in Engineering Handbook No.4 (EHB-4), Engineering Management Reporting System (EMRS), part 2, appendix F, using reporting code AACU. Add in the comment field that version 2.50 (ACU), version 1.80 (DCP), and J45 connector and the RS-422 adapter cables were installed. Please ensure that the serial number recorded in Block 8 reflects the most up to date information. Also, record the modification number in block 17(a) as 60 (see appendix C for a completed sample of NWS Form A-26).

The test sites, listed in appendix A, will be required to remove ACU test firmware 2.4i and install firmware version 2.50. ACU firmware version 2.4i should be properly packed and returned Woody Weir.

John McNulty
Chief, Engineering Division

Appendix A - Test Sites
Appendix B - Site Requiring V2.50
Appendix C - NWS A-26 Form

The Test Sites for Firmware version 2.50 are:

SID	CITY	STATE
ABQ	Albuquerque	NM
CLE	Cleveland	OH
FAI	Fairbanks	AK
MRB	Martinsburg	WV
SGF	Springfield	MO
SLC	Salt Lake City	UT

W/OSO321:W:Weir:713-1833x156
File:K:OSO32\OSO321\ASOS Temps\Mod60D
Updated:7/23/98;8/03/98:8/17/98:8/25/98:src
Spellchecked:7/23/98,8/03/98,8/17/98,8/25/98:ww,src

ASOS ACU Version 2.50 Sites

SID	City	State	Ownership	Site Requirement: NGRVR	
				S100-1A9W1	S100-1A9J22
ALASKA					
ADQ	KODIAK	AK	NWS		
AKN	KING SALMON	AK	NWS		
ANC	ANCHORAGE	AK	NWS		
BET	BETHEL	AK	NWS		
FAI	FAIRBANKS	AK	NWS		
JNU	JUNEAU	AK	FAA		
OME	NOME	AK	NWS		
CENTRAL					
APA	DENVER	CO	FAA		
AZO	KALAMAZOO	MI	FAA		
CMI	CHAMPAIGN/URBANA	IL	FAA		
COS	COLORADO SPRINGS	CO	NWS		
CVG	COVINGTON/CINCINNATI	KY	NWS		
DEN	DENVER	CO	NWS		
DLH	DULUTH	MN	NWS		
DSM	DES MOINES	IA	NWS		
DTW	DETROIT	MI	NWS	**X**	
FCM	MINNEAPOLIS	MN	FAA		
FNT	FLINT	MI	NWS		
FWA	FORT WAYNE	IN	NWS		
GFK	GRAND FORKS	ND	FAA		

SID	City	State	Ownership	Site Requirement: NGRVR	
GRR	GRAND RAPIDS	MI	NWS		
ICT	WICHITA	KS	NWS		
IND	INDIANAPOLIS	IN	NWS		
LAF	LAFAYETTE	IN	FAA		
LAN	LANSING	MI	NWS		
LBF	NORTH PLATTE	NE	NWS		
LNK	LINCOLN	NE	NWS		
MCI	KANSAS CITY	MO	NWS	X	
MDW	CHICAGO	IL	FAA		
MIC	MINNEAPOLIS	MN	FAA		
MKE	MILWAUKEE	WI	NWS	X	
MKG	MUSKEGON	MI	NWS		
MSN	MADISON	WI	NWS		
MSP	MINNEAPOLIS	MN	NWS		
OMA	OMAHA	NE	FAA		
ORD	CHICAGO	IL	NWS		
PIA	PEORIA	IL	NWS		
RFD	ROCKFORD	IL	NWS		
SBN	SOUTH BEND	IN	NWS		
SDF	LOUISVILLE	KY	NWS		X
SGF	SPRINGFIELD	MO	NWS		
STL	ST LOUIS	MO	NWS		
TVC	TRAVERSE CITY	MI	FAA		
EASTERN					
ALB	ALBANY	NY	NWS		
BDL	WINDSOR LOCKS	CT	NWS		
BGR	BANGOR	ME	FAA		

SID	City	State	Ownership	Site Requirement: NGRVR	
BTV	BURLINGTON	VT	NWS		
BUF	BUFFALO	NY	NWS		
BWI	BALTIMORE	MD	NWS		
CAE	COLUMBIA	SC	NWS		
CAK	AKRON	OH	NWS		
CHS	CHARLESTON	SC	NWS		
CLE	CLEVELAND	OH	NWS		
CLT	CHARLOTTE	NC	NWS		
CMH	COLUMBUS	OH	NWS		
CON	CONCORD	NH	NWS		
CRW	CHARLESTON	WV	NWS		**X**
DAY	DAYTON	OH	NWS		**X**
DCA	WASHINGTON DC	VA	NWS		
DMH	BALTIMORE	MD	NWS		
ELM	ELMIRA	NY	FAA		
EWR	NEWARK	NJ	NWS		
GSO	GREENSBORO	NC	NWS		
IAD	WASHINGTON DC	VA	NWS		
JFK	NEW YORK	NY	NWS		
LGA	NEW YORK	NY	NWS		
MRB	MARTINSBURG	WV	FAA		
OFP	ASHLAND	VA	FAA		
ORF	NORFOLK	VA	NWS		
PHL	PHILADELPHIA	PA	NWS		
PIT	PITTSBURGH	PA	NWS		
PVD	PROVIDENCE	RI	NWS		
RDU	RALEIGH/DURHAM	NC	NWS		
RIC	RICHMOND	VA	NWS		

SID	City	State	Ownership	Site Requirement: NGRVR	
ROA	ROANOKE	VA	NWS		
SYR	SYRACUSE	NY	NWS		
TEB	TETERBORO	NJ	NWS		
YNG	YOUNGSTOWN	OH	NWS		
PACIFIC					
HNL	HONOLULU	HI	NWS		
ITO	HILO	HI	NWS		
SOUTHERN					
ABQ	ALBUQUERQUE	NM	NWS		
ATL	ATLANTA	GA	NWS	**X**	**X**
BHM	BIRMINGHAM	AL	FAA		
BNA	NASHVILLE	TN	NWS		
BTR	BATON ROUGE	LA	NWS		
CHA	CHATTANOOGA	TN	NWS		
CRP	CORPUS CHRISTI	TX	NWS		
DAB	DAYTONA BEACH	FL	NWS		
DAL	DALLAS	TX	FAA		
DFW	DALLAS/FORT WORTH	TX	NWS		**X**
ELP	EL PASO	TX	NWS		
ESF	ALEXANDRIA	LA	FAA		
HSV	HUNTSVILLE	AL	NWS		
IAH	HOUSTON	TX	NWS		
JAN	JACKSON	MS	NWS		
JAX	JACKSONVILLE	FL	NWS	**X**	**X**
LBB	LUBBOCK	TX	NWS		
MAF	MIDLAND	TX	NWS		
MCO	ORLANDO	FL	NWS		

SID	City	State	Ownership	Site Requirement: NGRVR	
MGM	MONTGOMERY	AL	NWS		
MOB	MOBILE	AL	NWS		
MSY	NEW ORLEANS	LA	NWS		
OKC	OKLAHOMA CITY	OK	NWS		
PBI	WEST PALM BEACH	FL	NWS		
SAT	SAN ANTONIO	TX	NWS		
SAV	SAVANNAH	GA	NWS		
SHV	SHREVEPORT	LA	NWS		
SJU	SAN JUAN	PR	NWS		
TLH	TALLAHASSEE	FL	NWS		
TPA	TAMPA	FL	NWS		
TRI	BRISTOL/JOHNSON/KINGSPORT	TN	NWS		
TUL	TULSA	OK	NWS		
TYS	KNOXVILLE	TN	NWS		
WESTERN					
BIL	BILLINGS	MT	NWS		
CZZ	CAMPO	CA	NWS		
ELY	ELY	NV	NWS		
FAT	FRESNO	CA	NWS		
GCN	GRAND CANYON	AZ	FAA		
GEG	SPOKANE	WA	NWS		
LAS	LAS VEGAS	NV	NWS		
LAX	LOS ANGELES	CA	NWS		
LGB	LONG BEACH	CA	NWS		
ONT	ONTARIO	CA	FAA		
PDX	PORTLAND	OR	NWS		**X**
PHX	PHOENIX	AZ	NWS		
RNO	RENO	NV	NWS		

SID	City	State	Ownership	Site Requirement: NGRVR	
SAN	SAN DIEGO	CA	NWS		
SBA	SANTA BARBARA	CA	FAA		
SEA	SEATTLE	WA	NWS		**X**
SFO	SAN FRANCISCO	CA	NWS		
SJC	SAN JOSE	CA	FAA		
SLC	SALT LAKE CITY	UT	NWS		
SMF	SACRAMENTO	CA	FAA		
SNA	SANTA ANA	CA	FAA		
TUS	TUCSON	AZ	NWS		
VNY	VAN NUYS	CA	FAA		

WS HQ USE ONLY

WS FORM A-26 (4/94)
Supercedes WS Form A-23 and WS Form H-28, which are obsolete

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL WEATHER SERVICE

ENGINEERING MANAGEMENT REPORTING SYSTEM
MAINTENANCE RECORD

Document Number
G 49978

General Information	1. Open Date	Time	2. Initials	3. Response Priority (check one)	4. Close Date	Time
	09 / 23 / 98	0900	DKR	O Immediate O Low O Routine X Not Applicable	09 / 23 / 98	1200

5. Description

PERFORM MODIFICATION TO AACU AND ADCP I.A.W. MOD NOTE 60

Equipment Information	6. Station ID	7. Equipment Code	8. Serial Number	9. TM	10. AT	11. How Mal.
	PHL	AACU	000724	M	M	999

12. *EQUIPMENT OPERATIONAL STATUS TIMES*	a. **Fully Operational**	b. Logistics Delay	**Partly Operational**	c. All Other	d. Logistics Delay	**Not Operational**	e. All Other
	1:00						2:00

13. *Parts Failure Information*

Block #	a. ASN	b. NSN	c. TM	d. AT	e. How Mal.	f. Qty.	g. Maint. Hrs.
1							
2							
3							
4							
5							

14. *Work Load Information*

Type	Staff Hrs.
a. Routine	
b. Non-routine	
c. Travel	01:00
d. Misc.	02:00
e. Overtime	

Miscellaneous Information	15. Maintenance Comments	16. Initials
	Installed AACU Firmware version 2.50, ADCP Frimware version 1.80, J45 connector, and the RS-422 adapter cables	DKR

17. *SPECIAL PURPOSE REPORTING*	a. Mod. No.	b. Mod./Act./Deact.Date	c.	d.	e.
	60	09/23/98			

18. *CONFIGURATION MGMT. REPORTING* *(use as directed)*	a. Block #	b. Manufacturer's Part No. of New Part	c. Revision No. of New Part